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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SUCHFIELD, GEORGE A

ART UNIT	PAPER NUMBER
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3672

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/841,632

Applicant(s)

VINEGAR ET AL.

CB

Examiner

George Suchfield

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4500-4603 is/are pending in the application.
- 4a) Of the above claim(s) 4509, 4527, 4545, 4555 and 4558-4603 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4408, 4500, 4510-4526, 4528-4544, 4556 and 4557 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 4500-5603 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/1/04</u> | 6) <input type="checkbox"/> Other: _____ |

1.

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 4500-4573, drawn to a method of heating a coal formation at a temperature to allow syn-gas generation and providing a syn-gas generating fluid to generate and recover syn-gas, classified in class 166, subclass 261.
- II. Claims 4574-4603, drawn to a method of heating a pyrolyzing a coal formation with electric heaters, producing pyrolyzation fluid which is separated and directed to a fuel cell to produce electricity, classified in class 166, subclass 267.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different effects and different functions, e.g., the Group I invention is directed to syn-gas generation and recovery, while the Group II invention is directed to producing pyrolysis products from the formation to be separated above-ground and utilized to generate electricity.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. This application contains claims directed to the following patentably distinct species of the claimed invention within the Group I invention:

A. Heating a coal formation by in situ combustion or a natural distributed combustor/heater. Claims 4504-4507 and 4554 exemplify this species.

B. Heating a coal formation using an electrical heater(s). Claims 4508 and 4553 exemplifies this species.

C. Heating a coal formation by steam injection. Claim 4509 exemplifies this species.

D. Heating a coal formation by combusting a portion of produced synthesis gas. Claims 4527 and 4545 exemplify this species.

E. Heating a coal formation using a flameless distributed combustor(s). Claims 4555 and 4558-4573 exemplify this species.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 4500-4503, 4510-4526, 4528-4544, 4546-4552, 4556, and 4561 of the Group I invention are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after

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the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

6. During a telephone conversation with David W. Quimby on May 4, 2004 a provisional election was made without traverse to prosecute the invention of Group I, species A, claims 4500-4507, 4510-4526, 4528-4544, 4546-4552, 4554, 4556 and 4557. Affirmation of this election must be made by applicant in replying to this Office action. Claims 4508, 4509, 4527, 4545, 4553, 4555 and 4558-4603 stand withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

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9. New corrected drawings are required in this application because the Proposed Drawing Correction(s) (dated March 12, 2002) has been approved. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 4507, 4526, 4532, 4533, 4536, 4539-4541 and 4544 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4507 recites the limitation "reaction zones" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claims 4526 and 4544 recite the limitation "spent section" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 4532 and 4533 fail to clearly relate to parent claim 4500, and are therefore deemed indefinite. In this regard, it is not clear whether the "providing heat ..." step(s) of these claims are meant to further modify or define the "heating a section" step of parent claim 4500, or is in addition thereto.

Claims 4536 and 4539 recite the limitation "the separated carbon dioxide" in line 2 of each claim. There is insufficient antecedent basis for this limitation in the claim(s).

Claims 4540 and 4541 are deemed indefinite as they directly contradict parent claim 4534. In this regard, claim 4534 is limited to the use of carbon dioxide as the syn-gas generating fluid and includes specific steps to that end, while claims 4540 and 4541 call for a mixture of water and hydrocarbons as the syn-gas generating fluid. A dependent claim must further limit the parent claim, rather than providing an alternative. It is further unclear how these claims relate to the step of claim 4538 where the carbon dioxide is obtained from the formation.

12. Claims of this application may conflict with claims of applicant's one or more copending applications, e.g., Application No. 09/841,290, 09/841,292, 09/841,295, 09/841,304, 09/841,311, 09/841,435, 09/841,448 and 09/841,497. More specifically, applicant has filed numerous applications, each of which includes the same specification and collectively, these applications present over five thousand claims. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. In this regard, an analysis of each of the five thousand+ claims in each copending applications would be an extreme burden on the Office requiring tens of thousands of claim comparisons. Accordingly, applicant is required to either cancel any conflicting claims from all but one application or maintain a clear line of demarcation between these applications. See MPEP § 822.

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 4500-4508, 4510-4526, 4528-4544, 4546-4553, 4554, 4556 and 4557 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4504-4511, 4514-4530, 4532-4548, 4550-4556, 4558, 4560 and 4561 of copending Application No. 09/841,435. Although the conflicting claims are not identical, they are not patentably distinct from each other because the coal formation treated by the method of claims 4500 and 4534 of this pending application is deemed broad enough to encompass or comprise the hydrocarbon formation of claims 4504 and 4538 of the copending application. In this regard, it is further noted that pending claim 4500 can be construed broadly enough, e.g., in view of the language in line 1 of "A method ... comprising", to encompass or include the additional limitation(s) and/or step(s) in the '434, claim 4504 of heating a section of the formation with "one or more heat sources", "monitoring the composition of the produced synthesis gas" and "controlling providing of the heat to the section and ... synthesis gas generating fluid ... about 2.2:1". Similarly, it is noted that pending claim 4534 can be construed broadly enough, e.g., in view of the language in line 1 of "A method ... comprising", to encompass or include the additional limitation(s) and/or step(s) in the '434, claim 4538 of providing a synthesis gas generating fluid, which further comprises "water, and hydrocarbons having carbon numbers greater than 4", and "wherein at least a portion of the hydrocarbons react in the part to increase the energy content of the produced synthesis gas".

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The remaining pending claims 4501-4507, 4510-4526, 4528-4533, 4535-4544, 4546-4552, 4554, 4556 and 4557 all appear to correspond to or be encompassed overall by the '435 pending claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371⁶ of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior

art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 4500-4503, 4508 and 4514 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bridges et al (4,144,935).

Bridges et al discloses a process of heating a hydrocarbon-bearing formation which may comprise oil shale, coal or tar sands, e.g., as depicted in Figures 6, 13 and 14. In the process, the oil shale, coal or tar sands is initially heated to increase the permeability and recover vaporous and/or liquid hydrocarbons. Although Bridges et al discloses that the permeability increase is progressively established outward from the electrodes (note, e.g., col. 16, lines 59-65), which clearly comprise electrical heaters, as called for in claim 4508, it is deemed that upon conclusion of such initial heating phase, the coal or hydrocarbon formation will inherently or obviously possess a "substantially uniform" permeability, as called for in claim 4500. In this regard, note that Bridges et al indicates that, in one embodiment, "a relatively high degree of porosity and permeability will be present after removal of the liquid kerogen" (col. 17, lines 15-38). After such heating step, e.g. in a "first", "second" or "third processing version", Bridges et al (note, e.g., col. 17, lines 15-38) discloses an additional step of generating syn-gas from a formation zone(s) or block(s) previously so heated/exploited injection of a syn-gas generating fluid comprising a mixture of steam and air or oxygen.

As noted above, Bridges et al indicates that the heating step imparts "a relatively high degree of porosity and permeability" to the coal formation. Such high permeability effected is deemed to inherently or obviously equal or exceed 100 millidarcy, as called for in claim 4501.

The temperature range of claim 4502, to which the formation is heated prior to syn-gas generation, is encompassed by the temperature ranges set forth with respect to Figures 13 and 14

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in Bridges et al (col. 16, line 35 – col. 17, line 55) of, e.g., “above 500oC” with any difference therebetween deemed an obvious matter of choice or design.

As per claim 4503, it is deemed that the formation of Bridges et al will be additionally heated during the syn-gas generation phase due to the injection of steam as the syn-gas generation fluid, to inhibit temperature decrease.

As per claim 4514, as noted above with respect to claim 4503, the syn-gas generating fluid comprises steam.

18. Claim 4624 is rejected under 35 U.S.C. 103(a) as obvious over Bridges et al (4,144,935).

As per claim 4683, Bridges et al is deemed to necessarily or obviously “maintain” the pressure in the formation during syn-gas generation, e.g., by virtue of the continuous steam and air/oxygen injection ; to pass the produced syn-gas through a turbine to generate electricity would have been an obvious expedient or matter of choice to one of ordinary skill in the art to which the invention pertains insofar as the production syn-gas fluid is produced at considerable pressure and/or the use of a turbine, per se, to generate electricity is conventional and well-known.

19. Claim 4625 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bridges et al (4,144,935) as applied to claim 4500 above, and further in view of Terry (4,250,230).

Terry discloses a process for syn-gas generation from a coal formation with the further provision of utilizing the syn-gas for generating electricity from a fuel cell(s).

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains to similarly direct the syn-gas generated and produced by the process of

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Bridges et al to one or more fuel cells to generate electricity, in order to realize even greater economic benefit and practical application of the Bridges et al process.

20. Claim 4528 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bridges et al (4,144,935) as applied to claim 4500 above, and further in view of Riggs (4,476,927).

Riggs discloses a process for syn-gas generation from a coal formation with the further provision of directing the syn-gas to a Fischer-Tropsche synthesis process (col. 3, lines 42-47).

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains to similarly direct the syn-gas generated and produced by the process of Bridges et al to a Fischer-Tropsche synthesis process or unit operation to produce condensable hydrocarbons, as taught by Riggs, in order to realize even greater economic benefit and commercial value of the Bridges et al process.

21. Claim 4529 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bridges et al (4,144,935) as applied to claim 4500 above, and further in view of Terry (4,114,688).

Terry discloses a process for syn-gas generation from a coal formation with the further provision of directing the syn-gas to a converter unit (42) for production of liquid methanol (col. 13, lines 1-9).

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains to similarly direct the syn-gas generated and produced by the process of Bridges et al to a methanol converter unit, as taught by Terry, in order to realize even greater economic benefit and commercial value of the Bridges et al process.

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22. Claim 4530 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bridges et al (4,144,935) as applied to claim 4500 above, and further in view of Puri et al (4,662,443).

Puri et al discloses a process for syn-gas generation from a coal formation with the further provision of directing the syn-gas to a surface facility for production of, inter alia, gasoline (col.1, lines 19-32).

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains to similarly direct the syn-gas generated and produced by the process of Bridges et al to a gasoline converter or refining unit, , as taught by Puri et al, in order to realize even greater economic benefit and commercial value of the Bridges et al process.

23. Claim 4531 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bridges et al (4,144,935) as applied to claim 4500 above, and further in view of Redford (4,026,357).

Redford disclose a process for syn-gas generation from a hydrocarbon formation with the further provision of directing the syn-gas to a catalytic methanation unit (19) for the production of methane.

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains, to similarly direct the syn-gas generated and produced by the process of Bridges et al to a catalytic methanation unit for the production of methane, as taught by Redford, in order to realize even greater economic benefit and commercial value of the Bridges et al process.

24. Claims 4532 and 4533 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bridges et al (4,144,935) as applied to claim 4500 above, and further in view of Salomonsson (2,914,309).

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Salomonsson (Figure 3 and col. 3, lines 5-34) discloses heating of a hydrocarbon formation, including the use of electrical heaters, by providing or laying out the heater wells in a triangle and/or repeating triangle pattern, especially when heating and producing through each respective heater well.

Accordingly, it would have been obvious to one of ordinary skill in the art to which the invention pertains, to similarly carry out the process embodiments of Bridges et al, as set forth above, wherein the conductor boreholes or wells are provided in a triangle or repeating triangle pattern, as taught by Salomonsson, in order to enhance the overall formation heating, pyrolysis, and/or syn-gas generation effected by optimizing well location.

25. It is noted that claims 4504-4507, 4510-4513, 4515-4523, 4526 and 4534-4557 are rejected only under 35 USC 112(2) and obviousness double patenting, as set forth above.


26.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Suchfield whose telephone number is 703-308-2152. The examiner can normally be reached on M-F (6:30 - 3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 703-308-2151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


George Suchfield
Primary Examiner
Art Unit 3672

Gs
May 6, 2004